

The partial translation of the cited reference No. 2
(JPP'9-187015);

[0019]

[Embodiment of the Invention]

Hereafter, one aspect of the embodiment of this invention is explained.

Example 1:

Fig. 1 shows a configuration of an image encoder as used in the Example 1 of the present invention.

And in Fig. 1, 1 denotes a subtractor (locally decoded image generation means) which computes a differential image G_s by subtracting an estimated image G_e from the inputted image G_i , and 2 denotes a converter (locally decoded image generation means) which converses the differential image G_s output by the subtractor 1 into a discrete cosine transform and thereafter outputs the conversion result as the conversion factor G_{st} of the difference image G_s .

On the other hand, 3 denotes a quantizing means (locally decoded image generation means) which quantizes the conversion factor G_{st} outputted from the converter 2, and outputs the quantization coefficient G_q , while 5 denotes an inverse quantization means which inversely quantizes the quantization coefficient G_q output from the quantizing means and further outputs, the conversion factor G_{qt} .

Further, 6 denotes an inverse transforming means (locally decoded image generation means) which transforms the quantization coefficient G_q output from the inverse quantizing means 5 into reverse discrete cosine transform and outputs an error picture G_g , and while 7 denotes an adding means which adds

the estimated image G_e to the error image G_g output from the inverse transforming means 6 and outputs a locally.

[0020]

11 denotes STFM (a 1st memory means) which memorizes the local decoded image G_k output from the adding means 7, and STFM is the abbreviation for Short Term Frame Memory.

12 denotes a delay time control means (a 2nd memory means) which holds temporarily the locally decoded image G_k output from the adding means 7 and after the locally decoded image G_k has been output from the adding means 7 and after predetermined period has been elapsed, stores the locally decoded image G_k in LTFM13.

13 denotes a LTFM (a 2nd memory means) which memorizes the locally decoded image G_k output from the adding means 7, at a time being predetermined period earlier than a time when the locally decoded image G_k is stored in the LTFM11.

LTFM is the abbreviation for Long Term Frame Memory.

[0021]

14 denotes a block base forecasting means used for a first forecasting means which performs a motion compensation for every frame of the input image G_i with reference to the locally decoded image G_k memorized by STFM11 and LTFM13, and generates the estimated image G_e , the motion vector U_v and the prediction error E_g .

15 denotes a segment base forecasting means (a 2nd forecasting means) which performs a motion compensation for every segment area which constitutes the frame of the input image G_i with reference to the locally decoded image G_k memorized by STFM11 and LTFM13, and generates the estimated image G_e , the motion vector U_v and the prediction error E_g , as

a second forecasting means.

16 denotes a selection means (prediction means) which performs to obtain a deviation formed between the prediction error E_g generated by the block base forecasting means 14, and the prediction error E_g generated by the segment base forecasting means 15, and selects a prediction image G_e and the motion vector U_v generated by the block base forecasting means 14 or the segment base forecasting means 15 according to the deviation.

[0022]

17 denotes a variable length coding section (encoding means) which generates a variable length code word G_{ck} by performing the variable length coding of the quantization coefficient G_q outputted from the quantizing means 3, the motion vector U_v outputted from the selecting means 16 and the prediction parameter E_p output from prediction mode E_m and the segment base forecasting means 15.

18 denotes a buffer (quantized control means) a which stores the variable length code word G_{ck} generated from the variable length coding means and outputs the variable length code word G_{ck} to the image decoding means after when an accumulation value has been reached at a predetermined threshold value as the encoded bit streams CBS.

19 denotes a quantized control part which controls the quantized value q of the quantizing part 3 according to the buffer residue B_z (accumulated dose of the variable length code word G_{ck}) of the buffer 18.

[0023]

Fig. 2 shows a precise configuration of the block base forecasting means 14, and in Fig. 2, 21 denotes an estimated

image generation means which generates the estimated image G_{ea} so as to make the prediction error E_{ga} minimum, by performing a motion compensation for every frame of the inputted image G_i with reference to the locally decoded image G_k memorized by STFM11 and finally outputs the motion vector U_{va} and the estimated image G_{ea} .

22 denotes an error calculating means which subtracts the estimated image G_{ea} from the input image G_i and outputs an absolute value of the result of the subtraction thereof as the prediction error E_{ga} .

23 denotes an estimated image generation means which generates the estimated image G_{ec} so as to make the estimate E_{gv} minimum by performing the motion compensation, for every frame of the inputted image G_i with reference to the locally decoded image G_{ec} memorized by LTFM13, and outputs the estimated image G_{ec} and the motion vector U_{vc} .

24 denotes an error calculation means which subtracts the estimated image G_{ec} from the input image G_i , and computes the absolute value of the subtraction result as the prediction error E_{gc} .

25 denotes an interpolation image generation means which generates an average image(interpolation image) of the estimated image G_{ea} generated by the estimated image generation means 21 and the estimated image G_{ec} generated by the estimated image generation means 23, and outputs the interpolation image generation part which outputs the interpolation image thereof as the estimated image G_{eb} .

26 denotes an error calculation means which subtracts the estimated image G_{eb} from the inputted image G_i and outputs absolute value of the subtraction result as the prediction error

Egb.

[0024]

While, 27 denotes an error value comparing means which selects the minimum prediction error among the prediction error Ega-Egc outputted from the error calculation sections 22, 26, and 24 and outputs the minimum prediction error as the prediction error Eg, and outputs the selected result Egx.

28 denotes a prediction image selection means which selects a prediction image the prediction error thereof becomes minimum among the estimated images Gea-Gec, based on the selected result Egx which the error value comparing element 27 outputs.

29 denotes a motion vector selecting means which selects and outputs the motion vector Uva when the prediction image Gea is selected by the prediction image selection means 28, while when the prediction image Gec is selected, which selects and outputs the motion vector Uva.

On the other hand, when the prediction image Geb is selected, the motion vector selecting means outputs the motion vector Uva and the motion vector Uvc.

[0070]

Example 7:

Fig. 15 shows a configuration of one example of the image encoding means as used in the Example 7.

In Fig. 15, the explanations about the means having the same symbol as used in Fig.1 has been omitted.

81 denotes a delay time determining means (a delay time controlling means) which controls a time delay for memorizing time of the LTFM13 with respect to the STFM11 in accordance with

the buffer residue B_z (an data accumulation value in a variable length coded word G_{ck}).